ADOA-ASET

Project Investment Justification

Version 03.31.15

A Statewide Standard Document for Information Technology Projects

Project Title:

AELAS Arizona Education Data Standard (AzEDS)

Agency Name:	**Arizona Department of Education**
Date:	**May 5th 2015**
Agency Contact Name:	**Lisa Blyler**
Agency Contact Phone:	**602.542.3144**
Agency Contact Email:	**Lisa.Blyler@azed.gov**

Hover for Instructions

I. Project Investment Justification (PIJ) Type*

☐ **Yes** ☒ **No** Is this document being provided for a Pre-PIJ / Assessment phase?

If Yes,

Identify any cost to be incurred during the Assessment phase.	$
Based on research done to date, provide a high-level estimate or range of development costs anticipated for the full PIJ.	$

Explain:

Click here to enter text.

☐ **Yes** ☒ **No** Will a Request for Proposal (RFP) be issued as part of the Pre-PIJ or PIJ?

II. Business Case

*A. Business Problem**

The initial AELAS Standardized Student Data Store (under PIJ ED14004) created and implemented the foundation infrastructure which this PIJ will be utilizing and extending. The complexity of that project provided insight into additional support tools that ADE will need to create in order to support and maintain data integrity.

The infrastructure design is tightly aligned and extended from the Ed-Fi data model and the Common Education Data Standards (CEDS). The Ed-Fi data model is organized into 16 base domains. Domains serve to provide views of the Ed-Fi Unifying Data Model to assist in its understanding and its application. In many cases, a specific Ed-Fi data exchange schema may only deal with data in a single domain, such as assessment or enrollment. In other cases, it may span several domains, such as with a student transfer record.

Due to the challenges of the Ed-Fi data model, Student Information Systems (SIS) Vendors were not ready to submit data on the original schedule, and sufficient LEAS integration testing has not been completed prior to the cut over deadlines.

Agency departments did not have a full understanding of how they will extract and use the Ed-FI Data.

*B. Proposed Business Solution**

The data submitted by the LEAs in Fiscal Year 2016 will be processed from either Student Accountability Information System (SAIS) submissions, or from submissions to the AzEDS Application Programming Interface (API), with data cross populated to support the SAIS and the AzEDS systems running in parallel. SAIS will be maintained as the system of record while Local Education Agency (LEA) is given time to incrementally (by LEA) migrate data submissions via the AzEDS API. Data submitted in AzEDS will be pushed back into SAIS, as well as submitted SAIS data will be pushed into AzEDS. This will allow for a transition over the year until June 2016 where AzEDS will become the system of record. This solution provides more time for Vendors and LEAs to validate and configure the system to submit data.

LEAs will receive notifications if their SIS vendors are not certified and will be encouraged to migrate to a SIS vendor who is. LEAs have already been notified if they do not submit data in the new format that they will not receive state funding.

Release 2.1 Certification

In Fiscal Year 2016, ADE will create certification scenarios for Release 2.1 and have the vendors certify that they are accurately submitting the data for Release 2.1 components.

Milestones:

- Create Vendor Certification 10/31/2015
- Publish Vendor Certification 1/30/2016

Assumptions:

- Release 2.1 will contain Grand Canyon and Dropout Recovery data only
- The Grand Canyon and Dropout Recovery data collected in AzEDS for Fiscal Year 2016 will not be used by ADE

Reports

In Fiscal Year 2016, ADE will create reports from the new system for various stakeholders including Federal Reports to receive federal money for programs; AzEDS summary reports to review student data collected; and LEA reports to support the validation of the new system. In addition, ADE will create internal agency reports to provide information to agency employees.

Milestones:

- 8 reports completed 9/30/2015
- 6 reports completed 12/31/2015
- 5 reports completed 3/31/2016

Assumptions:

- Release 2.1 has all the data needed to create Federal reports.
- The reports will use the AZ Dash reporting portal solution.
- Federal Regulations do not change during the Fiscal Year 2016.

Support Tools

In Fiscal Year 2016 ADE will create reports and users screens for internal ADE users to provide information and support LEA on the data they submitted. ADE will initially create manual data scripts and reports of the tools in Excel while supporting the application, and then migrate them into an application for long term use by the Help Desk.

Milestones:

- Complete design of support tools 8/1/2015
- Complete development and testing of support tools*
- Complete user acceptance testing of support tools*
- Complete deployment and implementation of support tools*

*(Date will be determined after Design Milestone)

Assumptions:

- Design for the support tools will be completed by 6/30/15 and the rest of the development activities will occur in Fiscal year 2016.
- New support tools will not need to go through Security Penetration testing.
- Performance testing will not be needed on support tools.

- The current solution has logging turned on and the data needed for support tools is captured in the current solution.
- Support tools will first be created to be executed manually then automated as the solution is rolled out.
- Able to create a log of who has changed the data and what data was changed using the support tools for audit purposes.

Data Validation Service

Data from the new Ed-Fi Student Data Interchange will be compared and verified against SAIS Transaction and Integrity. This will allow for accurate testing of the AzEDS system prior to it becoming the system of record.

Milestones:

- Complete Data Validation Service requirements and design: 8/1/15
- Complete Data Validation Service requirements development and testing: 9/15/15
- Complete Data Validation Service requirements user acceptance testing: 9/30/15
- Complete Data Validation Service requirements deployment and implementation: 10/15/15

Assumptions:

- The report will be used by ADE employees to verify the accuracy of the new system.

915 Process / Data Collection

ARS § 15-915 allows an LEA to amend the past three years of data for correction of state aid or budget limit errors, which may result in correction of payment amounts. In Fiscal year 2016 ADE will develop functionality that supports the submission of "915" adjustment transactions into the AzEDS system for use by the School Finance Department. This requires potential development and testing cycles with each of the SIS Vendors.

Milestones:

- Complete requirements and design of 915 Processes: 8/30/15
- Complete development and testing of 915 Processes*
- Complete user acceptance testing of 915 Processes*
- Complete deployment and of 915 Processes*

*(Date will be determined after Design Milestone)

Assumptions:

- The LEAs will maintain the data through their SIS vendor solution and stay the system of record for their student data.
- No new API will be needed in the data submittal process so security testing is not required. If new API is required, testing will be included.
- Vendors are able submit for prior fiscal years. State law does not change for this function.

Unique ID / Split Merge

The default Ed-Fi interchange provided by DLP (vendor partner for EDFI Alliance) does not handle the volumes needed by Arizona. The default solution also does not address the need to provide correct unique id to students in case where one student has been assigned two unique ids (Merge) or also when a single id has been assigned to two students (Split). ADE is required to develop a solution that can handle the state student population volume, utilize better search criteria and add clean up data tasks to handle data entry mistakes.

Fiscal Year 2016 Objective of Split/Merge: In order to maintain accurate student and staffing counts, ADE needs a mechanism to flag data that was entered incorrectly through name

changes and data entry mistakes. The system needs to be able to identify the master record and correct data entry mistakes by merging records that were entered incorrectly or splitting records into two. ADE needs a mechanism to transmit flagged data to SIS vendors so they can accurately correct the data maintained by LEAs.

Milestones:

- Complete requirements gathering for Split/Merge: 6/30/15
- Complete Design Split/Merge: 7/31/15
- Complete development and testing of Split/Merge*
- Initiate vendor certification of Split/Merge*
- Complete vendor certification of Split/Merge*
- Complete user acceptance testing of Split/Merge*
- Complete deployment and implementation of Split/Merge*

*(Date will be determined after Design Milestone)

Assumptions:

- ADE will identify data entry mistakes across LEAs and provide that information to LEAs.
- Vendor certification of the function will occur to validate that data passing between ADE and LEA is correct.
- Training for LEA administrative staff and internal users will be provided by their SIS Vendor.
- The SIS vendors may need to modify their systems to consume Unique ID changes as determined by the ADE Unique ID component.
- Security testing will need to occur on the data entry points from SIS vendors.

Project Implementation

ADE will provide support on the **Ed-Fi model and state reporting** to the LEAs during the pilot period with each SIS vendor, and assist in rollout to the AzEDS Rest API Services in Fiscal Year 2016. Plan goal will be up to 90 LEAs migrating per month after the SIS pilot period.

Milestones:

- Complete vendor readiness: 7/15/2015
- Complete vendor implementation: 6/01/2016
- Complete LEA readiness: 8/15/2015
- Complete LEA implementation: 6/30/2016
- Complete production implementation for Pilot LEAs 9/1/2015

Assumptions:

- The majority of SIS vendors will have passed Release 2 certification by June 2015. Otherwise the LEAs of non-certified Vendors will be asked to switch to SIS Vendors.
- ADE will provide support on both current and future releases to Vendors and LEAs.
- Pilot will consist of 1 to 3 LEAs per vendor.
- Training materials will be created and provided to LEAs by ADE and SIS vendors.

Version 3

The following Data Domains will need to be implemented using the Ed-Fi model to complete the deliverable of reducing agency applications in Fiscal Year 2017

1. Community College
2. LEA/School Calendar
3. Bell Schedule
4. Graduation
5. AZ Safe (Discipline)

Milestones:

- Complete requirements gathering of Version 3: 8/1/2016

- Complete design Version 3 9/1/2016
- Complete development and testing of Version 3*
- Initiate vendor certification of Version 3*
- Complete vendor certification of Version 3*
- Complete security penetration of Version 3*
- Complete performance testing of Version 3*
- Complete user acceptance testing of Version 3*
- Complete deployment and implementation of Version 3*

*(Date will be determined after Design Milestone)

Assumptions:

- ADE will continue to use the Ed-Fi model for data collection.
- New API version released for data collection will need security testing.
- Vendor certification will be required to ensure correct submittal of data, otherwise LEAs will not receive Keys to submit data.
- Six months lead time will be required to provide vendors requirements in order for them to incorporate changes.
- Each component will:
    - Enable REST API
    - Incorporate integrity rules through InRules
    - Have reports to validate the data
    - Transport the data to the Agency ODS

New Charter Estimated Counts –

As part of the overall 915 process and the initial analysis of the current submission for charter estimated counts, the project calls for additional requirements analysis and design for Ed-Fi because of some concerns with accuracy and timeliness in the data submission. The Ed-Fi solution can be used to increase accuracy and efficiency in the data gathering techniques that are then used in the payment calculations.

The objective of this feature is to implement more accurate estimates of charter counts than the online application being used today. The data will be used to project payments for charter schools until they reach their 40th day in which the data collected is used to forecast payments. The approach will use the data the charter schools submitted through AzEDS at the beginning of the year.

Milestones:

- Complete design for Charter Estimated Counts 7/31/2016
- Complete development and testing for Charter Estimated counts*
- Complete user acceptance testing for Charter Estimated Counts*
- Complete deployment and implementation of Charter Estimated Counts*

*(Date will be determined after Design Milestone)

Assumptions:

- No new data collection will be needed.
- As no new API is needed, Security testing is not required.
- No additional SIS vendor requirements or work is needed.

New Student Information Rules Service

The Exceptions Web service exposes the business rule exceptions so the SIS can consume the status of their transactions submitted and have the LEA data steward correct the exceptions. This function will be a future enhancement to be completed in Fiscal Year 2017.

Milestones:

- Complete design for Student Information Rules: 7/30/2016
- Complete development and testing for Student Information Rules*
- Complete user acceptance testing for Student Information Rules*
- Complete deployment and implementation of Student Information Rules*

*(Date will be determined after Design Milestone)

C. *Quantified Benefits**

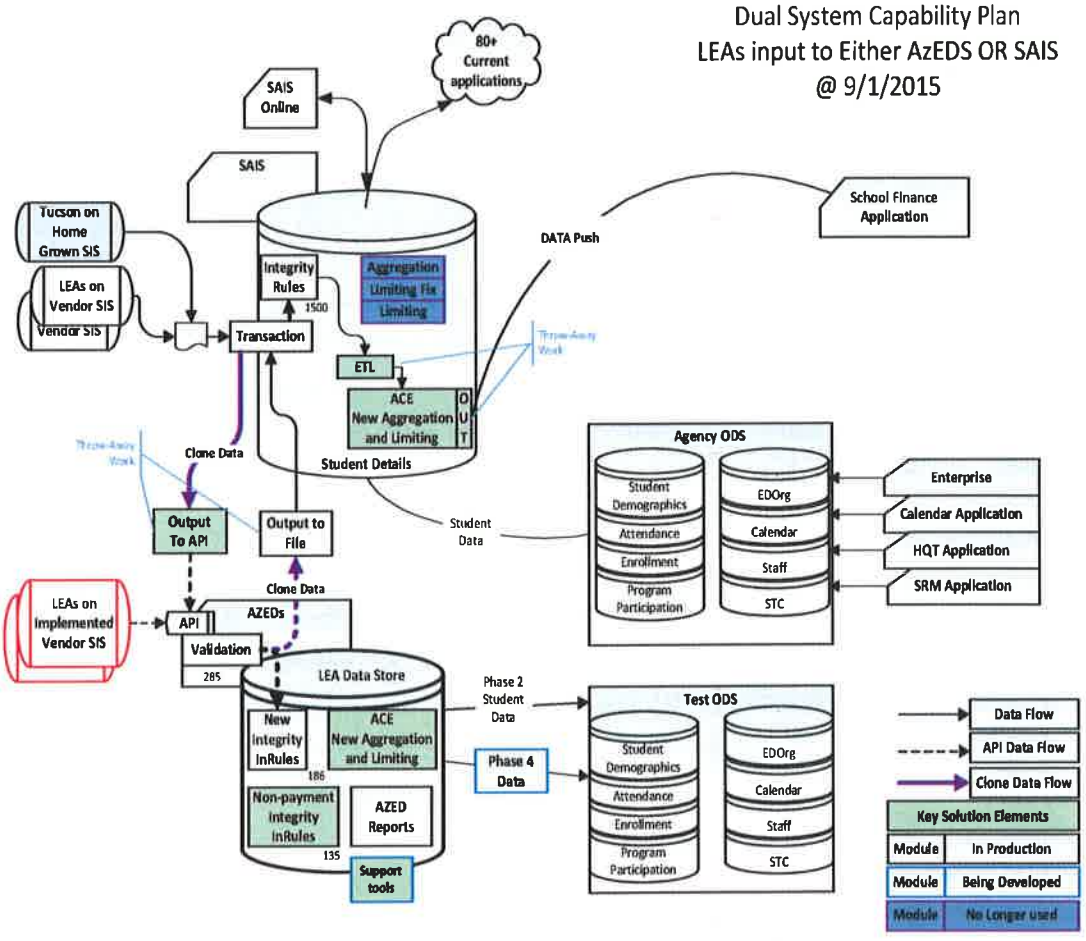
x	Service enhancement
	Increased revenue
x	Cost reduction
x	Problem avoidance
x	Risk avoidance

Explain:

AELAS Business Case

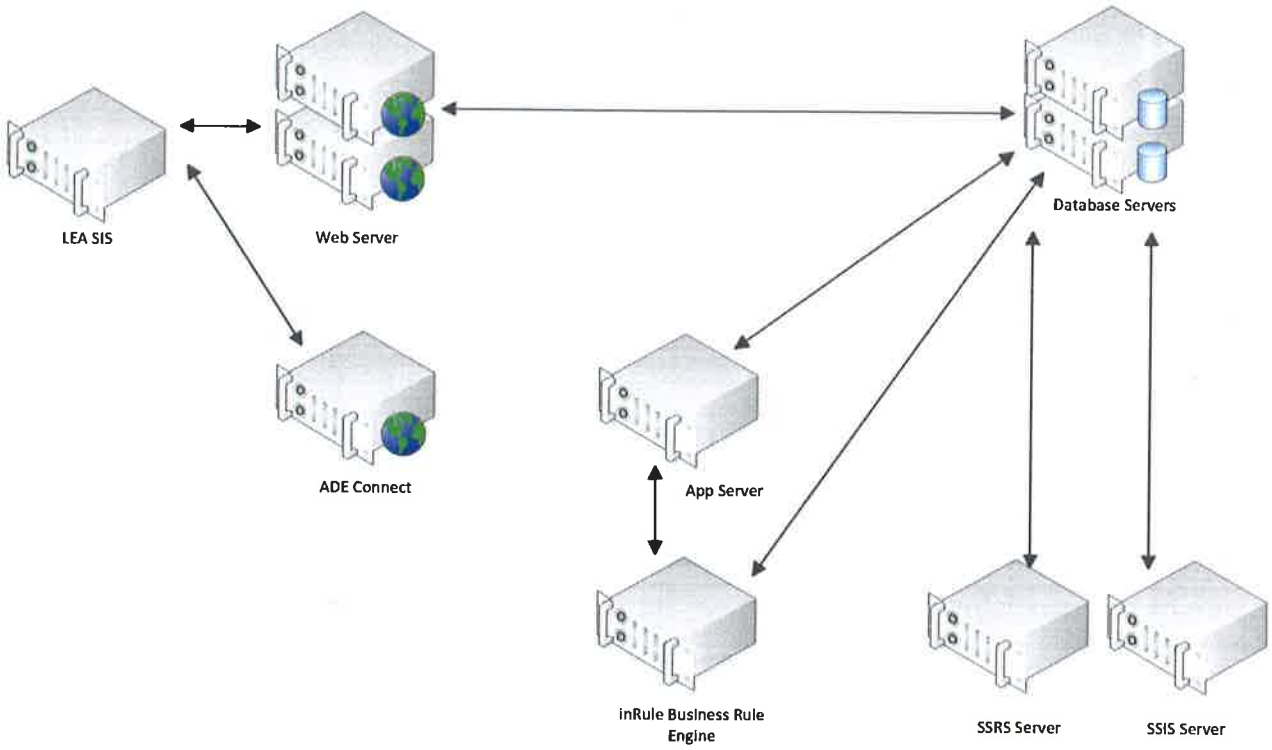
III. Technology Approach

A. *Proposed Technology Solution**



The Ed-Fi SDS web services, application process and database components will be deployed on various servers for performance and scale out reasons. The system will be deployed on the new hardware that

will be provisioned as part of the AELAS Standardized Student Data Store (under PIJ ED14004). The Deployment Model figure below shows the various servers involved and the roles of each server.



LEA SIS

The LEA SIS hosted by the LEA will be the primary system that will integrate with the Ed-Fi AzEDS web services that are hosted. Communication between the SIS and the ADE Web services server will be enabled through https web protocol. The SIS will first have to authenticate with the ADE Connect and obtain an authentication token. The SIS will then have to supply the authentication token with every web service request.

Web Server

The Ed-Fi REST API web services and the Exceptions web service will be deployed to the web servers. The web servers should be load balanced in production environment. These web services should be deployed to IIS on the server. IIS should be configured to use its own application pool. The application pool identity should be configured to use a service account provisioned through Active Directory.

ADE Connect

The web services will use ADE Connect to validate the authentication token submitted with the request.

App Server

The Student Business Rules processor will be deployed to this App server. The rules processor will use the InRule rules engine to validate the rules.

InRule Business Rules Engine Server

The student transactions that are collected through the web services will have to be validated against business rules that are deployed to InRule Business rules engine. This business rules engine is deployed on its own server.

Database Server

The new student transaction database should be hosted in a clustered database server in production environment.

SSRS Server

A variety of reports are to be generated by the new Ed-Fi SDS system. The reports will be implemented using SQL Server Reporting Services (SSRS) and deployed to the SSRS Server.

B. Existing Technology Environment

Technology Stack

The following technologies are selected to fulfill the requirements of the Ed-Fi SDS project.

- Microsoft Windows 2008 R2 or 2012 Server for Operating system
- Microsoft .Net 4.5 framework with C# programming language
- Microsoft ASP .Net MVC4 for Web User Interface
- Microsoft Windows Communication Services (WCF) 4.5 for Web services
- Microsoft Entity Framework 6.0 or Dapper for Data Access
- Microsoft SQL Server 2008 R2 or 2012 for database server
- Microsoft SQL Server Integration Service (SSIS) 2008 R2 or 2012 for ETL packages
- Microsoft SQL Server Reporting Services (SSRS) 2008 R2 or 2012 for reports
- InRule 4.5 for Business Rules Engine

The proposed technology stack listed above will eventually replace the current system that is built on decade old technology such as VB6, COM+, ASP and SQL Server 2000.

Over and above the hardware in use for the project, the project will also use the Azure Cloud environment to support performance needed to handle the large volume of transactions.

- Web servers will be placed in the Azure Cloud environment which will handle the data collection from the LEAs.

- Valid LEA data will be stored in a data store located in the Azure cloud. When the data is checked against Business Rules, clean data will be passed onto ADE's ODS located on premise.
- OAuth 2.0 will be used to authenticate Ed-Fi submission from LEAs. The OAuth is part of the Ed-Fi Alliance API development. ADEConnect will continue to be used for authentication and authorization for LEAs to access their reports.
- The operational costs of Azure are not paid through this PIJ. The ongoing subsequent Azure costs are slated to be paid by ADE's operational budget.

C. Selection Process

In October 2012, the Data Governance Commission enforced the recommendation to implement Master Data Management policy using the Common Education Data Standards (CEDS) and Ed-Fi as the state adopted standard moving forward for any new development and procurement.

The Ed-Fi solution is a universal educational data standard and tool suite that enables vital academic information on K-12 students to be consolidated from the different data systems of school districts while leaving the management and governance of data within those districts and states. The standard and tool suite includes a unifying data model, data exchange framework, application framework, and sample dashboard source code. The Ed-Fi solution is open, XML-based, and CEDS-aligned to integrate information from a broad range of existing sources so it can be sifted, analyzed and put to use every day. Ed-Fi components act as a universal translator of academic data, integrating and organizing information.

ADE is aligning its data collection, business process and technical to Ed-Fi standards. This proposed project is one of the many steps required to meet the Data Governance Commission's recommendation.

IV. Project Approach

A. Project Schedule

Project Start Date: 7/1/2015 **Project End Date**: 6/30/2017

B. Project Milestones

Major Milestones for FY15**	Start Date	Finish Date
Release 2.1 Rest API Developed and Deployed	1/1/2014	6/30/2015
Vendor Certification Release 2.0	6/1/2014	6/30/2015
Verification Reports Deployed	9/1/2014	6/30/2015
Unique Id Search Deployed	1/1/2015	6/30/2015
Security Test Release 2.1 Rest API	6/1/2014	5/31/2015
Performance Test Release 2.1	12/1/2014	5/31/2015
Integrity 2.1 Payment Rules	9/1/2014	6/30/2015

**These milestones are tracked under PIJ ED14004

Major Milestones for FY16	Start Date	Finish Date
Integrity 2.1 Rules Complete	7/1/2015	9/30/2015
Support Tools Design Complete	7/1/2015	8/30/2015
Split/Merge Design Complete	7/1/2015	9/30/2015
915 Design Process Complete	7/1/2015	9/30/2015
Complete 8 reports	7/1/2015	9/30/2015
Complete 6 reports	10/1/2015	12/31/2015
Complete 5 reports	1/1/2016	3/31/2015
Complete SAIS to AzEDS Integration requirements and design	7/1/2015	7/15/2015
Complete SAIS to AzEDS Integration development and testing	7/16/2015	8/7/2015
Complete SAIS to AzEDS Integration user acceptance testing	8/10/2015	8/21/2015
Complete SAIS to AzEDS Integration deployment and implementation	8/24/2015	9/1/2015
Complete Data Validation Service requirements and design	7/1/2015	8/1/2015
Complete Data Validation Service requirements development and testing	8/1/2015	9/15/2015
Complete Data Validation Service requirements user acceptance testing	9/15/2015	9/30/2015
Complete Data Validation Service requirements deployment and implementation	9/30/2015	10/15/2015
Complete requirements and design of 915 Processes	6/1/2015	8/30/2015
Complete Design Split/Merge	6/1/2015	7/31/2015

Initial Estimated Major Milestones for FY17	Start Date	Finish Date
Complete requirements gathering of Version 3:	5/2016	8/2016
Complete design Version 3	9/2016	10/2016
Complete design for Charter Estimated Counts	7/2016	8/2016
Complete design for Student Information Rules:	6/2016	7/2016

Project Roles and Responsibilities

Project Sponsor – The project sponsor will represent ADE's business needs for the project. The Sponsor serves as providing the agency commitment to the project, and signs off on any changes or acceptance criteria for agreed-upon deliverables. The project sponsor also provides guidance to the Project Manager and implementation team regarding general policy or outcomes.

Project Manager – The project manager serves as the lead for the project and ensures fulfillment of tasks and outcomes for the project. This manager is also the point person for interactions with the vendor and any other contractors brought on to implement the project. The project manager is expected to:

- Plans and conducts meetings with Project sponsor
- Develops overall Project Plan

- Manages individual tasks and the resources assigned to accomplish tasks
- Directs issue management process
- Completes status reports for ADE audiences
- Manages any changes in scope
- Conducts weekly project meetings
- Signs off on deliverables or change orders along with the Project Sponsor

Data Architect - The data analyst role for this project is critical for documenting and explaining the relationships between various data elements within the system and other integrated systems. The Data Architect will also develop the new database design and data warehousing schemas. The data architect will also support the technical lead and project manager during the testing and migration phase of the project to ensure that business data is being handled properly and is able to be used as required by ADE

Solutions Architect – The solutions architect is a vital member of the project team and will assist the project team in developing the solution in accordance with ADE standards and guidelines. The solutions architect will assist the project team in resolving issues surrounding the integration with various systems as they arise during implementation.

Business Analyst – The business analyst serves as the lead for translating business requirements into a format understandable for the technical team. The ADE business analyst for this project will see most of his/her work during the requirements gathering and preparation phase of the project. The analyst will then remain part of the team and will handle ongoing issues and requirement changes as they arise.

Technical Lead – The technical lead serves an important role in supporting the project manager by directing technical development, including coding and roll-out of the software but also testing and migration processes. The Technical lead is also responsible for resolving technical issues throughout implementation and ensuring the solution meets technical specifications identified by ADE.

Lead Developer

Responsible for reviewing the technical detail designs with the Architect/Developer and providing technical guidance, defect resolution as needed, and providing regular updates to the Project Manager.

Developer

Responsible for development and unit testing the requirements/use cases and detail designs, with defect resolution as needed.

Quality Analyst

Responsible for Creating and maintaining a Master Test Plan, Ensuring availability of resources , Estimating, budgeting, and planning, Executing the master test plan within budget and time constraints, Reporting on progress and quality of end product, ensuring that all conditions have been met.

Technical Write- The technical writer documents and translates the technical documentation to help non-technical people use the AzEDS systems. They will provide editing, proofreading, edit and formatting to the materials produced by the project team.

V. Risk Matrix, Areas of Impact, Itemized List, PIJ Financials

Project Investment Justification.xlsx

VI. Project Approvals

A. *Agency CIO/ISO Review and Initials Required**

Key Management Information	Yes	No	Inits
1. Is this project for a mission-critical application system?	X		
2. Is this project referenced in your agency's Strategic IT Plan?	X		
3. Have you reviewed and is this project in compliance with all applicable Statewide policies and standards for network, security, platform, software/application, and/or data/information located at https://aset.az.gov/resources/psp? If **NO**, explain in detail in section **"VIII. Additional Information"** below.	X		
4. Will any PII, PHI, or other Protected Information as defined in the 8110 Statewide Data Classification Policy located at https://aset.az.gov/resources/psp be transmitted, stored, or processed with this project? If **YES, the Protected Data section under "VII. Security Controls" below will need to be completed.**	X		
5. Will this project migrate, transmit, or store data outside of the agency's in-house environment or the State Data Center? If **YES, the Hosted Data section under "VII. Security Controls" below will need to be completed.**	X		
6. Is this project in compliance with the Arizona Revised Statutes and GRRC rules?	X		
7. Is this project in compliance with the Statewide policy regarding the accessibility to equipment and information technology for citizens with disabilities?	X		

B. *Project Values**

The following table should be populated with summary information from other sections of the PIJ.

Description	Section	Number or Cost
Assessment Cost (if applicable for Pre-PIJ)	I. PIJ Type - Pre-PIJ Assessment Cost	$
Total Development Cost	V. PIJ Financials tab	$2,000,000.00
Total Project Cost	V. PIJ Financials tab	$2,000,000.00
FTE Hours	See Hover text for FTE Hours	0

C. *Agency Approvals**

Approver	Printed Name	Signature	Email and Phone
Project Manager:	Randall Lohn		Randall.Lohn@azed.gov 602.617.5864
Agency Information Security Officer:	Robert Callahan SURESH P.		Robert.Callahan@azed.gov 602.542.9250
Agency CIO:	Mark Masterson		Mark.Masterson@azed.gov 602.542.3542
Project Sponsor:	Shari Zara		Shari.Zara@azed.gov 602.364.2347
Agency Director:	Michael W. Bradley		Michael.Bradley@azed.gov 602.542.5423

VII. Security Controls

Collaboration with the ADOA-ASET Security, Privacy and Risk (SPR) team may be needed to complete this section, which is only required for those projects that involve data that is Protected or Hosted outside of the Agency or State Data Center. Additional information can be found in the NIST FRAMEWORK section under RESOURCES at https://aset.az.gov/resources/psp or you may wish to contact ASET-SPR directly at secadm@azdoa.gov for assistance.

A. *Protected Data*

ADE will be using Microsoft Azure Cloud - Infrastructure as a Service (IaaS) for processing. Connectivity between ADOA datacenter and Azure Cloud IaaS occurs over Point to Point VPN. ADOA is currently reviewing baseline security controls for the Microsoft Azure Cloud platform.

B. *Hosted Data*

[X] Check here if the https://aset.az.gov/arizona-baseline-security-controls-excel spreadsheet is attached. Otherwise explain below what information/ support is needed to complete the spreadsheet and/or why no sheet is attached:

See Attachments section for attached Controls Excel file.

[X] Check here if a Conceptual Design / Network Diagram is attached. Otherwise explain below what information/support is needed to complete the diagram and/or why no diagram is attached:

See embedded diagrams above

VIII. Additional Information

IX. Attachments

The following are examples of supporting documents that should be sent as email attachments when required:

A. Attachment for section VII Security Controls :

Arizona_Baseline_Security_Controls ADE I

X. Glossary

Other Links:
ADOA-ASET Website
ADOA-ASET Project Investment Justification Information Templates and Contacts

Email Addresses:
Strategic Oversight
ADOA-ASET_Webmaster@azdoa.gov